OPEN MEETING AGENDA ITEM

Docket No. E-01345A-13-0069

SEDONA SMART METER AWARENESS
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DATE: **December 9, 2014**
TO: **Arizona Corporation Commissioners**
FROM: **Monnie Ramsell and Nancy Baer, Co-founders, Sedona Smart Meter Awareness**
RE: **Evaluation of ADHS Report on Health Safety of Smart Meters**
Docket No. E-01345A-13-0069

ORIGINAL

Ladies and Gentlemen,

The ADHS report is a stunning example of interdisciplinary research gone wrong. As is often the case with interdisciplinary research, experts in their own field badly misinterpret and make erroneous assumptions about information and principles in a field foreign to them. Medical and health researchers unfamiliar with engineering principles, measurement protocols and metrics, make invalid measurements and draw invalid conclusions from them. On the other hand, engineers make invalid assumptions about biological processes and their medical outcomes, such as tissue heating.

Thousands of peer reviewed publications leave no doubt as to the biological activity of extremely small doses of electromagnetic radiation. Yet, engineers who set safety standards long ago supposedly to protect us did so without medical considerations and insist the only biological effect of concern is tissue heating.

ADHS did not do a study as requested by the ACC. By coming to conclusions by reviewing existing literature and cherry picking only those studies that claimed no association of a particular health effect with RF, ADHS **is putting all Arizonans at risk.**

Reports such as these have perpetuated the cloud of misinformation that surrounds the real facts regarding public health and safety. The ADHS study should be discarded and re-done -- not by doctors or engineers, but by professional individuals who have expertise in both fields who are able to properly integrate the information to draw valid conclusions about public safety.

BACKGROUND: The Arizona Corporation Commission requested an independent study
Because of Arizona consumer complaints about adverse health effects caused by Smart Meters, The Arizona Corporation Commission voted in June 2013 to request the Arizona Department of Health Services conduct an **independent study** on the potential health effects of exposure to radio frequencies emitted from Smart Meters. (See June 28, 2013 memo from Steve Olea submitted to the Docket.) The report done by ADHS is not a study, but rather a report citing selective research to support its conclusion that "Smart Meters are not likely to harm your health."

SSMA Meeting with Arizona Department of Health Services (ADHS)

In February 2014, Sedona Smart Meter Awareness and former Sedona Councilpersons Barbara Litrell and Dan McIlroy met with ADHS regarding its study. We were told by Don Herrington that his team did not have much experience with Radio Frequency Radiation Exposure and, in fact, this was its first project on RF radiation. Its area of expertise is limited to toxicology and it did not have any experience with measuring any RF emitting devices either. Mr. Herrington also told us that it did not have the budget or the expertise to launch a full study. All ADHS could do was to perform a review existing literature and back its conclusions by hiring Arizona Radiation Regulatory Agency (AARA) to take field measurements. Our group even told Commissioner Brenda Burns when we met with her a month later in March that there are concerns that ADHS won't be doing a thorough study because of its lack of budget and expertise. Therefore, the findings of the ADHS are not surprising given its limitations in budget and expertise.

As noted in the ADHS report (page 2), "the most important use for RF energy is in providing telecommunications services. Smart Meters, cell phones, Wi-Fi Routers, computers and radio and television broadcasting are just a few of the many telecommunications applications of RF energy." Therefore, in studying Smart Meter technology and its effects it is advisable to review studies done on other devices, including cell phones.

Not a single study proving RF Radiation safe

Not one study in the world has been able to prove that RF radiation from microwaves is harmless to human beings. Most independent scientific studies to date (i.e., those that are not entirely or partially financed by the wireless industry and telecoms) not only show biological effects, but also show adverse health effects on living beings, including humans. And studies done by the wireless industry that DO show problems are ignored or suppressed and the researchers are defunded and maligned. A classic example of this is the industry research done by George Carlo, Ph.D, JD, former chairman of the CTIA Wireless Technology Research Program (WTR). Carlo spent 5 years on a $28 million research study paid for by telecoms. The research showed biological effects and also evidence of health effects, in particular on DNA, that were later confirmed by the large REFLEX study done by the European Community. In 1999, Carlo wrote the following letter to the CEO of AT&T:

"*Since 1993, I have headed the WTR [wireless technology research] surveillance and research program funded by the wireless industry. The goal of WTR has always been to identify and solve any problems concerning consumers' health that could arise from the use of these phones. This past February, at the annual convention of the CTIA, I met with the full board of that organization to brief them on some surprising findings from our work . . .*

The rate of death from brain cancer among handheld phone users was higher than the rate of brain cancer death among those who used non-handheld phones that were away from their head;

The risk of acoustic neuroma, a benign tumour of the auditory nerve that is well in range of the radiation coming from a phone's antenna, was fifty percent higher in people who reported using

cell phones for six years or more, moreover, that relationship between the amount of cell phone use and this tumour appeared to follow a dose-response curve;

The risk of rare neuro epithelial tumors on the outside of the brain was more than doubled, a statistically significant risk increase, in cell phone users as compared to people who did not use cell phones;

There appeared to be some correlation between brain tumors occurring on the right side of the head and the use of the phone on the right side of the head...

Today, I sit here extremely frustrated and concerned that appropriate steps have not been taken by the wireless industry to protect consumers . . .

Alarmingly, indications are that some segments of the industry have ignored the scientific findings suggesting potential health effects, have repeatedly and falsely claimed that wireless phones are safe for all consumers including children, and have created an illusion of responsible follow up by calling for and supporting more research."
Dr. George Carlo's Letter to AT&T Chairman & CEO," www.emf-health.com, Oct. 7, 1999

The following link will provide more information:
http://www.emf-health.com/dr-george-carlo.htm If you watch the video on this link you will see an insider taking the industry to task.

When Carlo presented his findings to the US government, they included his estimations of 500,000 US citizens a year by 2010 contracting cancer and 25% of the population by 2014 as a direct result of mobile phone abuse. Wirelessfacts.co.uk believes this is a gross underestimation. Carlo and his family were threatened physically, his finances were threatened, one of his homes was burned down and the fire brigade suspected arson. One of the things Carlo was supposed to ratify was SAR (specific absorption rates) based on thermal effects as a method or guideline for handset safety. This, like the ICNIRP guidelines for mobile phone mast safety, as Carlo discovered, was completely the wrong issue to look at
http://wirelessfacts.co.uk/index.html

- Video interview with Dr George Carlo, Ph.D., (extract).
http://www.next-up.org/divers/carlo_1.php

- Alert letter from Pr. Franz Adlkofer, general coordinator European Union Study REFLEX.
http://www.next-up.org/pdf/pr_adlkofer_correspondance_reflex_icnirp.pdf
- Video interview with Pr Franz Adlkofer (extract). http://www.next-up.org/divers/carlo_3.php

The Microwave Syndrome, an effect of the Smart Meter and other wireless technology has been documented.

http://next-up.org/pdf/MicrowaveSyndrome012007Uk.pdf

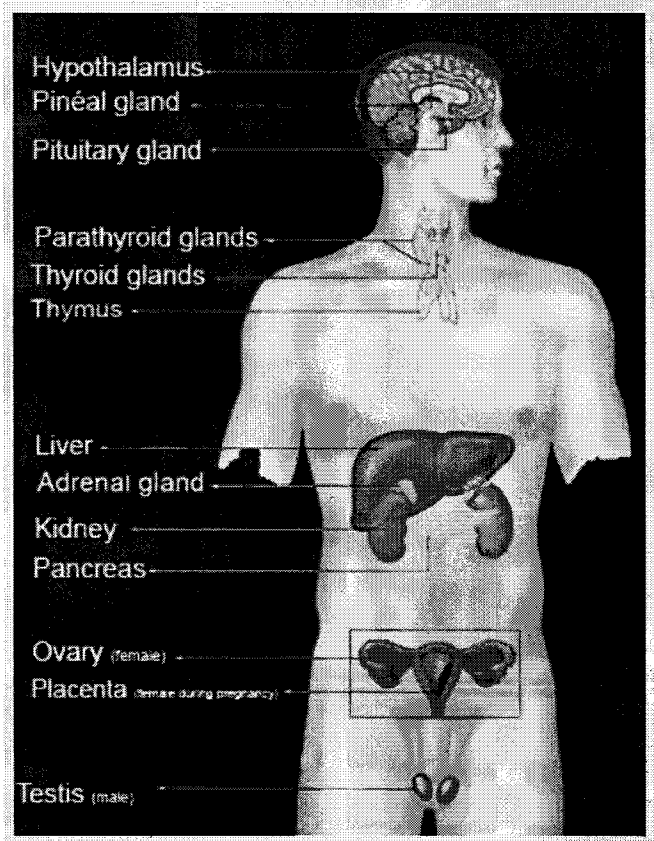
The interaction of EMF from hyper frequencies with the human bio-electromagnetic metabolism generates the so-called microwave syndrome or hyper frequency syndrome.

Those responses are divided in 3 stages:

1. Stress reception by sensorial organs and their relating nerves.

2. Programming of the stress reaction at the cortex and the limbic system (LS) levels (tonsils, olfactory bulb, hippocampus, septum, maxillary body ...). The Cortex/LS couple is a comparative analysis system using a data bank of "memory" based on experiences. Therefore the brain compares the new situation with past experiences in order to create an adapted response.

3. Activation of the response from the organism via the tonsils and the hippocampus that act on the hypothalamus and on the cerebral trunk reticulated formation in order to activate the Vegetative Nervous System (VNS) and the Adrenal Gland (AG). The alarm amplitude is regulated by the Limbic System (LS).



Look carefully on this picture where the hypothalamus, the pineal gland and the hypophyse are located !...

Mechanisms

Mechanisms and effects in alarm and resistance phase characterise the microwave syndrome :

▶ First case, alarm phase :

The brain subject to a short stimulation of artificial EMF radiation of microwave type triggers specific reactions from the organism involving neuronal, neuro-endocrinal, metabolic and behavioural responses.

A- Those responses fall in the general scheme of an individual stress adaptation, this in a more or less adapted manner.

B - The take over of the stress element (radiation) is done by :

- The Central Nervous System (CNS),
- The Peripheral Nervous System (PNS)
- The Endocrinal System (ES).

☐ Second case, resistance phase:
After the alarm phase, if the stress element persists even at low dosage (ex: radiation from phone masts) or becomes chronic (e.g., radiation of an addicted mobile phone user who does not respect the body auto regulation in relation to the SAR rating of his mobile), the result is that the hypothalamus, etc. . . . are going to assess these constant stresses and activate the secretion of various hormones.

Unfortunately as a rule, a human being exposed to artificial radiations does not have a pre-established strategy in his cognitive repertoire to efficiently defend himself against this type of attack. Therefore, the hypothalamus stimulation produces a stereotyped non adapted response to this type of aggression . . . which often increases the negative impacts.

• As far as the metabolism of some people is concerned, everything will go smoothly temporarily during a period from a few days to several decades; however their health capital is eroding really rapidly. There is a risk that pathologies such as Alzheimer's disease that "usually" appear when approaching the third age risk could appear earlier.

• As far as the metabolism of all the people in a state of weakness (sick people, elderly), fetus, babies, etc. . . . there is a rapid exhaustion and state of disorder of all nervous and endocrine systems, and consequently of the immune system.

This will promote and initiate the emergence of a number of known pathologies.
The end result of this mechanism is what is called the MICROWAVE SYNDROME.

The most usual pathologies resulting from the microwave syndrome are (non exhaustive list):

• **Dystonic cardiovascular syndrome**: bradycardia, tachycardia, hyper/hypo blood pressure, and Atherosclerosis.
• **Chronic diencephalic syndrome**: dizziness, sleep troubles, concentration disturbance, sensory troubles, and loss of concentration, chronic fatigue syndrome.
• **Chronic asthenia syndrome**: fatigue, irritability, nausea, headaches, anorexia, and depression.
• **Cancerous pathology**: leukemia, glutathione and melanoma, breast cancer . . . (the file InVS)
• **Dermatologic pathology**: dermatitis, dermatosis, eczema, psoriasis, and skin allergy.
• **Dopaminenergic pathology**: Parkinson, legs without rest, loss of sensibility in 4 limbs, tightened arms at wake-up, cramps in limbs.
• **Immune pathology**: blood formula (high rate of lymphocytes).
• **Hyper Sensibility pathology**: attributed beforehand to psychic disturbances!
• **Pre and post-native pathology**: great premature (often before or around gestation age), toxic foetopathy, miscarriage, retarded growth, biometrics, genotype modification, then puberty modification (of which associated to BBB opening).
• **Procreative pathology**: drastic decrease of semen (infertility).
• **Hypogonadism pathology**: drastic decrease of libido (stimulating follicle hormone).
• **Brain pathology**: tumors, opening of the BBB (Blood Brain Barrier), electroencephalogram disturbances.

- **Standard pathology**: visual and hearing perturbations, nose bleedings, injured corner lips, jaw bleedings, fibromyalgy, allergy, asthma, tooth neuralgia, etc.
- **Psychical pathology**: lack of concern, introversion, passiveness, submissiveness, depression and mental anorexia, suicide ... and cerebral activity (behavior control).
- **Disturbances of socio-professional behavior**: irritability, discomfort, and ...increased risk of accident. Stress, depression, suicide.

One has to ask, why was all this information ignored in the ADHS study?

Federal Communications Commission (FCC)
ADHS, in its report tries to give the impression that the FCC is the expert on public health protection, yet on the FCC website, it clearly states:

" The FCC's primary jurisdiction does not lie in the health and safety area, and it must rely on other agencies and organizations for guidance in these matters." http://transition.fcc.gov/oet/rfsafety/rf-faqs.html#Q1

So the FCC made it clear that it is **NOT** a health and safety protection agency.

Also from the FCC website,

"The Commission does not regulate exposure to emissions from these devices. ***Protecting the public from harmful radiation emissions from these consumer products is the responsibility of the U.S. Food and Drug Administration (FDA)."***

The FCC website also says,

"The FCC relies on the expertise of the Food and Drug Administration (FDA) and other federal health, safety and environmental agencies to help determine safe levels for human exposure to RF energy. In adopting its guidelines for RF exposure, the FCC considered opinions from these agencies."

"The FDA, which has primary jurisdiction for investigating mobile phone safety, ***has stated that it cannot rule out the possibility of risk*** *. . ."*

US Food and Drug Administration (FDA)
Yet this statement appears on the FDA website...

"Under the law, FDA does not review the safety of radiation-emitting consumer products such as cell phones and similar wireless devices before they can be sold, as it does with new drugs or medical devices."

Therefore: Who is in charge of Radiation-emitting products safety?
FCC says it relies on the safety expertise of the FDA, and states it considered opinions from the FDA in setting its safety guidelines, but the FDA officially does not review the safety of radiation-emitting products, then **where is the responsibility for assuring safety actually domiciled?**

On what basis does the FCC, a communications commission charged with regulating interstate and international communications, not a health agency, have authority to ascertain safety and establish safety guidelines in the first place? On what basis has the FCC assumed this responsibility?

What public health expertise, if any, exists at the FCC and who specifically set the current standards and what was his/her background in biology?

Research has shown that the source of scientific funding in this field influences outcomes. In determining safety guidelines for RF emitting devices, how much does the FCC rely on the telecom industry funded science, as opposed to independent science where there would not be a commercial conflict of interest?

Given evidence exists showing that in certain amplitude windows a lower SAR value can result in greater brain effects than a higher SAR value (increased neuron death and blood brain barrier permeability, for example), suggesting some biological effects do not occur in a linear, dose-response manner. Thus, the SAR may be a wholly inadequate measure of safety on these grounds. Given this, and the fact that the SAR does not reflect either the non-thermal biological effects, or the ELF effects, why is the SAR used as a measure of safety?

Here is an example of the inadequacy of the FCC guideline. The current SAR limit for cell phones is 1.6 W/kg, but according to the AACPS (American Association For Cell Phone Safety) letters, research in the 1990s (Tice and Hook) showed micronuclei in blood doubled when the cells were exposed to radiation at only 1 W/kg of SAR. In light of this, why was 1.6 W/kg chosen as the limit and not a number less than 1 W/kg? Germany has been advocating a cell phone SAR safety level of 0.6 W/kg through its "Blue Angel" Program which grants a special eco-seal of approval to all phones meeting the lower SAR standard.

Does this give you enough confidence that the FCC guideline is really adequate in protecting your health? Why did the ADHS not acknowledge this?
Experts say a true biological standard for cell phone radiation exposure should be set, especially for children, elderly and vulnerable populations, instead of relying on estimates of safety based on a physics measure that only measures the heating effect. Is either the FCC or the FDA working on biologically based guidelines or even studying biological effects? What scientific experts with backgrounds in EMF effects on biology are Advisors to the FCC and FDA?
Why is the ADHS not challenging this?

Does FCC monitor emissions to ensure safety?
If that is not enough to raise serious red flag, here's more from the FCC's website.

"The Commission does NOT have a comprehensive, transmitter-specific database for all of the services it regulates."

"FCC does NOT have the resources or the personnel to routinely monitor the emissions for all of the thousands of transmitters that are subject to FCC jurisdiction."

"It should be emphasized that the FCC does NOT perform RF exposure investigations unless there is a reasonable expectation that the FCC exposure limits may be exceeded."

Did ADHS get the idea that if they can hide behind the FCC limits, then they would not really have to do a real study to reveal the truth?

Environmental Protection Agency (EPA)
Norbert Hankin, Radiation Protection Division of the United States Environmental Protection Agency wrote In a letter to Janet Newton:
(http://www.emrpolicy.org/litigation/case_law/docs/noi_epa_response.pdf),

"I believe that it is correct to say that there is uncertainty about whether or not current guidelines adequately treat nonthermal prolonged exposures (exposures that may continue on an intermittent basis for many years . . . "

"The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronic engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, are thermally based, and do not apply to chronic, nonthermal exposure situations. *They are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock and burn. The hazard level (for frequencies generally at or greater than 3 MHz) is based on a specific absorption dose-rate, SAR, associated with an effect that results from an increase in body temperature. The FCC's exposure guideline is considered protective of effects arising from a thermal mechanism but* ***not from all possible mechanisms. Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified."***

Norbert Hankin in his above mentioned letter continued to comment,

"Federal health and safety agencies have not yet developed policies concerning possible risk from long-term, nonthermal exposures. When developing exposure standards for other physical agents such as toxic substances, health risk uncertainties, with emphasis given to sensitive populations, are often considered. Incorporating information on exposure scenarios involving repeated short duration/nonthermal exposures that my continue over very long periods of time (years), with an exposed population that includes children, the elderly, and people with various debilitating physical and medical conditions, could be beneficial in delineating appropriate protective exposure guidelines."

So on what basis can ADHS say that the "FCC safety factors are then incorporated to determine specific levels of exposure aimed to provide sufficient protection for various segments of the population (including children, the elderly, etc.) when there is no such policy nor is there any expertise on that commission?

From someone like Mr. Hankin, who is the expert of radiation protection stating that the FCC's exposure guideline will not protect us from **"harm by any or all mechanisms"** is really a wake-up call.

Experts say a true biological standard for Radio Frequency radiation exposure should be set, especially for children, elderly and vulnerable populations, instead of relying on estimates of safety based on a physics measure that only measures the heating effect. Is either the FCC or the FDA working on biologically based guidelines or even studying biological effects? What scientific experts with backgrounds in EMF effects on biology are advisors to the FCC and the FDA?'

Why did ADHS not clarify the limitations of the FCC and the FDA which affects the outcome of its findings?

By the way, ADHS kept using the term "standards" when referring to the FCC's guidelines. What is the difference between the standard and guideline?

Standards: These consist of specific low level mandatory controls to ensure and control consistency.
Guidelines: These consist of recommended, non-mandatory controls that assist the standard when no mandatory control has been specified. These can be considered Best-Practices.

The FCC is required by the National Environmental Policy Act of 1969, among other things, to evaluate the effect of emissions from FCC-regulated transmitters on the quality of the human environment. The official regulations document is a *Report and Order.* In addition, the FCC's Office of Engineering and Technology (OET) has issued Bulletin No. 65 *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.* This is a guidance document—not the regulations.

ADHS's flawed and misleading logic and assumption
ADHS' claim that there is no sufficient evidence to support a need for additional standards to protect the public from Smart Meters is irresponsible. Even the FCC is questioning its guidelines and has asked for public comment on their revision.

Is ADHS even aware of the fact that the FCC's guidelines are currently under review? (See FCC Proceedings ET Docket No. 03-137 and WT Docket No. 12-357). The Commission's RF safety guidelines are inadequate because the rules are based on physics rather than biological studies.

Complete text of FCC 12-152

"These proceedings allow the public to inform the FCC why it must update its RF safety guidelines in order to comply with its proposal "to amend its rules to 'ensure that the public is appropriately protected from any potential adverse effects from RF exposure.'" For example, FCC's current RF safety guidelines do not take into account published research on the biological effects brought on by the ability of RF signals to communicate with living tissue."

Why did the ADHS report not mention that FCC guidelines are up for review? Would it not have triggered the precautionary principle to be applied to protect Arizonans?

Health Risks from RF exposure:

Prolonged RF radiation exposure can

- damage brain cells and DNA
- cause cancer (leukemia in children and brain tumor in adults)
- and adversely affect central nervous, cardiovascular, and immune systems

Studies linked electromagnetic pollution to:

- decreased testosterone levels in men
- miscarriages in pregnant women
- birth defects in babies
- Alzheimer's disease
- Cataracts
- depression and suicides
- chronic fatigue and more

All of the above would be considered adverse health effects.

Why did ADHS cite outdated statements from the World Health Organization (WHO)?

According to World Health Organization (WHO), "Electromagnetic fields of all frequencies represent one of the most common and fastest growing environmental influences, about which anxiety and speculation are spreading."

The office of Technology Assessment of the Congress of United States recommends a policy of "prudent avoidance" of man-made electromagnetic fields.

The International Agency for Research on Cancer (IARC) - the research arm of WHO - **classifies extremely low-frequency magnetic fields as Group 2B carcinogen (considered possibly carcinogenic to humans).**

Just like APS, ADHS chose to quote the WHO statement from 2005 on EHS but selectively left out the classification of RF as Class 2B carcinogen on May 31, 2011. Such deliberate omission only shows ADHS' bias trying to hide the fact of known health fact of RF radiation being possibly cancer causing.

Why did the ADHS ignore the Oregon Physicians' Report?

As noted above, the FCC is currently reviewing its existing guidelines and has asked for public comments. One of these comments was a submission by Dr. Paul Dart on the health impact of Smart Meters titled "**BIOLOGICAL AND HEALTH EFFECTS OF MICROWAVE RADIO FREQUENCY TRANSMISSIONS - A REVIEW OF THE RESEARCH LITERATURE**." This report was originally submitted in full to Docket E-00000C-11-0328 by Barbara Litrell on January 21, 2014 and again by Dr. Stefan Kasian on March 2, 2014 but the report did not appear in the Docket until March 26, 2014 under the title "Notice of Filing - Miscellaneous" by Brenda Burns, Commissioner, A.C.C. (http://images.edocket.azcc.gov/docketpdf/0000152038.pdf).

The Oregon Physicians' Report on Health Effects of RF Radiation of Smart Meters: Oregon doctors were tasked with doing the same kind of study that the ADHS was tasked with doing, yet ADHS totally ignored the report. Why?

A group of independent physicians led by Paul Dart, M.D., Kathleen Cordes, M.D., Andrew Elliott, N.D., James Knackstedt, M.D., Joseph Morgan, M.D., Pamela Wible, M.D. and Steven Baker produced the most in-depth and unbiased report on the health impact of smart meters. They raised the issues that laboratory research in animal and human subjects has shown that "non-thermal" levels of RF exposure can alter EEG, immune function, and hormone levels including adrenal and thyroid hormones, testosterone, prolactin, progesterone. It also states that research shows that low levels of RF exposure can reduce melatonin levels in humans. This can produce insomnia as well as impair the body's ability to repair damaged DNA and heal from other effects of oxidant stress. Reduction in Melatonin can lead to increased tumor growth in a variety of cancer types including breast cancer and prostate cancer.

The report also raised the issue that research has shown that RF exposure levels well within current guidelines can cause DNA damage, and reduced fertility, lower sperm counts, and sperm motility in human beings.

In addition, they found that existing scientific research offers strong evidence that the chronic exposure of the public to microwave RF transmissions produces serious acute and chronic health effects in a significant portion of the population with the findings summarized in the following precepts:

Basic Precepts for Residential Exposures to RF Transmissions:

- Excessive RF exposure can cause acute problems (headaches, insomnia, fatigue, vertigo, tinnitus, other symptoms of EHS).
- Excessive RF exposure can also cause chronic problems (oxidative stress, cancer, male infertility).
- Constant RF transmission is probably harmful, even at low levels, and should be avoided.
- Frequent and repetitive intermittent transmissions are also probably harmful, and should be avoided.
- Nocturnal exposures are more problematic than daytime exposures, because of RF's potential to suppress nocturnal melatonin secretion and disturb sleep, and because night is the time when we rest and heal from stresses (including oxidative stress).
- Occasional and infrequent daytime exposures are much less likely to cause an increase in chronic problems for the population at large.
- Occasional and infrequent daytime exposures are still likely to provoke acute symptoms in a small percentage of the population.

Our bodies are sensitive to even weak electromagnetic radiation. For example, low frequency electromagnetic radiation can affect your body's circadian rhythms. It affects the production of melatonin hormone, which is produced by brain's pineal gland. Melatonin is a hormone that regulates the biological rhythms of mammals.

Research done at Battelle Pacific Northwest Labs has documented that prolonged exposure to electromagnetic radiation causes reduced melatonin secretion. Reduction of melatonin level threatens your health and can result in psychiatric disorders like depression, shortened attention span and inability to sleep.

Decreased melatonin production can also increase the permeability of the "blood-brain barrier," leaving you even more vulnerable to chemicals toxic effects.

The blood-brain barrier is a kind of safety barrier Nature has provided you to prevent dangerous molecules from entering the brain and causing damage. When you are exposed to chemicals that find its way inside your bodies, two protective mechanisms are utilized. Melatonin neutralizes the free radicals (cancer-causing agents) created by the chemicals. And the blood-brain barrier prevents chemicals from entering the brain and spinal cord.

Exposure to electromagnetic radiation breaks down the blood-brain barrier and hinders this protective mechanism. It will also affect the permeability of cell membrane of your nerves, blood vessels, skin, and other organs.

The intricate chromosomes DNA has also been shown to be affected by electromagnetic field. And iron, necessary for healthy blood and is stored in brain, is highly affected by electromagnetic radiation too.

The Oregon physicians' report notes:

"***The Elster meter's transmission rate was variable.*** *In our observations, they are definitely transmitting several times a minute, sometimes 4 or 5 times a minute, and occasionally in* ***bursts of significantly higher frequency.***"

Why did ADHS rely on measurements taken over a 15 minute period instead of a 24 hour period? APS said that its smart meters only transmit data 6 times a day. If that is true, the chance of picking up the sharp spikes of higher frequency during data transmission is extremely slim. Reading being picked up may just be the beacon signals and not the higher and longer data signals.

The report also says,

"At 5 feet from the smart meter, the peak strength of the beacon signal coming off the meter measured from 3800 to 11,000 $\mu W/m^2$. At 20 feet from the meter, the power density of the signal ranged from 362 to 493 $\mu W/m^2$, with occasional bursts at higher power output.

This means that at a distance of 20 feet the power of the signal coming out of the Elster meter was about 1OO times the power of the ambient background signal coming from any specific direction in the residential neighborhood.

This power density of 300+ to 400+ $\mu W/m^2$ was greater than the signal strength of the cell phone tower at 29th and Amazon, measured from about 200 meters away. ***So filling a neighborhood with a mesh network of the Elster smart meters would be similar to placing every house in that neighborhood closer than 200 meters from a cell phone tower,*** *each house constantly being pinged by the chatter of multiple beacon signals from the mesh.*

This was disconcerting, since recent research has shown that people living within 500 meters of a cell phone tower have increased incidence of headache, concentration difficulties, and sleep disorders, and also a significantly increased risk of some types of cancer. (Khurana et al., 2010) (Levitt and Lai, 2010) (Yakymenko et al., 2011) (Altpeter et al., 2006) (Abdel-Rassoul et al., 2007)

When you put these facts together, it is not so surprising that the installation of mesh smart meter networks in residential neighborhoods in California last year was followed by a surge of anecdotal evidence regarding headaches, insomnia and other health complaints. From a medical perspective, based on a familiarity with current research on the biological effects of RF, this was a predictable consequence of PG&Es smart meter MESH network rollout."

In Arizona, we also witnessed this surge of anecdotal evidence in the form of insomnia, seizures, blindness, heart palpitation, chest pain and other health complaints.

Sedona Smart Meter Awareness had given this Oregon Physicians' Report to ADHS because we shared the same concerns as these physicians and hoped that ADHS would do a real study to confirm its findings. The response we received from AHDS was:

". . . .it appears that the report that we are producing is more limited in scope than what you are anticipating. From the onset of the project, we have tried to provide to those inquiring, exactly what our role in the project will be. I hope, from the ADHS perspective, we have been clear in what our capability is, as it relates to this project. Our expertise is limited to human toxicology.

We will be limited to examining the transmission signals to see if they conform to what has been federally approved. If the transmissions exceed/deviate from allowable federal standards, then we will do research into literature, and consult with our CDC partners to see if there is any cause and effect relationship that has been documented that would be detrimental to human health. Based on your email, I didn't want anyone to have expectations beyond our capability ***(limitations in expertise, funding, capacity, technological resources).***"

Clearly, ADHS has no expertise, funding, capability or technological resources to do a thorough study as requested by ACC to see if smart meters are safe.

In order to justify its report, they have chosen to ignore the lists of peer-reviewed studies on RF exposures **below** the FCC's exposure guideline as shown below. These biological effects can cause serious harm to our harmful and not as benign as ADHS tried to make us believe.

Why did ADHS ignore the Oregon Physicians' Report and omit it completely from its own report? Why did ADHA ignore the data and reports below? Why did ADHS rely on the same tainted, industry funded and influenced reports that APS relied on? Below is a list of studies done on effects of RF all BELOW the FCC guidelines:

Stress proteins, HSP, disrupted immune function:

- Chronic exposure to base station RF (whole-body) in humans showed increased stress hormones; dopamine levels substantially decreased; higher levels of adrenaline and nor-adrenaline; dose-response seen; produced chronic physiological stress in cells even after 1.5 years ***Buchner, 2012***;
- RFR caused significant effect on immune function in mice **Fesenko, 1999**;
- RFR affected function of the immune system ***Novoselova, 1999***;
- Altered cell membranes; acetycholine-induced ion channel disruption ***D'Inzeo, 1988***;
- RFR caused drop in NK lymphocytes (immune function decreased) ***Boscolo 2001***;
- 20 minutes of RFR at cell tower frequencies induced cell stress response ***Kwee, 2001***;
- RFR affected human lymphocytes - induced stress response in cells ***Sarimov, 2004***;
- Increase in serum cortisol (a stress hormone) ***Mann, 1998***;
- Immune system effects - elevation of PFC count (antibody producing cells) ***Veyret, 1991***;
- Pulsed RFR affected immune function in white blood cells ***Stankiewicz, 2006***;
- RFR caused genetic changes in human white blood cells ***Belyaev, 2004***,
- Changes in immune function ***Elekes, 1996***;

- Heat shock protein HSP 70 is activated by very low intensity microwave exposure in human epithelial amnion cells ***Kwee, 2001***
- 750 MHz continuous wave (CW) RFR exposure caused increase in heat shock protein (stress proteins). Equivalent to what would be induced by 3 degree C. heating of tissue (but no heating occurred) ***De Pomerai, 2000***;
- A significant change in cell proliferation not attributable to thermal heating. RFR induces non-thermal stress proteins (960 MHz GSM) ***Velizarow, 1999***;
- Immune system effects - elevation of PFC count (antibody-producing cells) ***Veyret, 1991***;
- Hyperactivity caused by nitric oxide synthase inhibitor is countered by exposure to ultra-wide band pulses (600/sec) for 30 min ***Seaman, 1999***;
- Elevation of immune response to RFR exposure ***Elekes, 1996***;
- Cell phone use causes nitric oxide (NO) nasal vasodilation (swelling inside nasal passage) on side of head phone use ***Paredi, 2001***;
- GSM cell phone exposure induced heat shock protein HSP 70 by 360% (stress response) and phosphorylation of ELK-1 by 390% ***Weisbrot, 2003***;
- GSM cell phone exposure of 1-hr activated heat shock protein HSP 27 (stress response) and P38 MAPK (mutagen-activated protein kinase) that authors say facilitates brain cancer and increased blood-brain barrier permeability, allowing toxins to cross BBB into brain ***Leszczynski, 2002***;
- 900 MHz cell phone exposure for 1-hr significantly altered protein expression levels in 38 proteins following irradiation; activates P38 MAP kinase stress signaling pathway and leads to changes in cell size and shape (shrinking and rounding up) and to activation of HSP 27, a stress protein (heat shock protein) ***Leszczynski 2004***

Brain tumors and blood-brain barrier

- RFR induced 10%-40% increase in DNA synthesis in glioma cells (brain) ***Stagg, 1997***;
- RFR induced pathological leakage of the blood-brain barrier ***Persson, 1997***;
- RFR increased biomarker for cell division in glioma brain tumor cells ***Stagg, 1997***;
- Cell phone RFR caused a pathological leakage of the blood-brain barrier in 1 hour ***Salford; 2003***;
- RFR affected genes related to cancer ***Ivaschuk, 1999***;
- A pathological leakage in the blood-brain barrier with 915 MHz cell RF ***Salford, 1994***;
- Changes in brain glial cells with TDMA 836.55 MHz frequency ***Stagg, 1997***;
- 915 MHz cell phone RFR caused pathological leakage of blood-brain barrier. Worst at lower SAR levels and worse with CW compared to Frequency of pathological changes was 35% in rats exposed to pulsed radiation at 50% to continuous wave RFR. Effects observed at a specific absorption (SA) of > 1.5 joules/Kg in human tissues ***Persson, 1997***;
- Cell phone RFR induces glioma (brain cancer) cells to significantly increase thymidine uptake, which may be indication of more cell division ***Salford, 2003***;
- A single, 2-hr exposure to GSM cell phone radiation results in serious neuron damage (brain cell damage) and death in cortex, hippocampus, and basal ganglia of brain- even 50+ days later blood-brain barrier is still leaking albumin (P<.002) following only one cell phone exposure ***Salford, 2003***;

Cell phone RFR doubles pathological leakage of blood-brain barrier permeability at two days (P=.002) and triples permeability at four days (P=.001) at 1800 MHz GSM cell phone radiation ***Schirmacher, 2000*** ;

- 900 MHz cell phone exposure caused brain cell oxidative damage by increasing levels of NO, MDA, XO and ADA in brain cells; caused statistically significant increase in 'dark neurons' or damaged brain cells in cortex, hippocampus and basal ganglia with a 1-hr exposure for 7 consecutive days ***Ilhan, 2004***

Reproduction/fertility effects

- Chronic exposure to mobile phone pulsed RF significantly reduced sperm count ***Behari, 2006***;
- Sperm head abnormalities in mice exposed for 6-months to base station level RF/MW. Sperm head abnormalities occurred in 39% to 46% exposed mice (only 2% in controls) abnormalities was also found to be dose dependent. The implications of the pin-head and banana-shaped sperm head. The occurrence of sperm head observed increase occurrence of sperm head abnormalities on the reproductive health of humans living in close proximity to GSM base stations were discussed." ***Otitoloju, 2010;***
- Irreversible infertility in mice after 5 generations of exposure to RFR from an 'antenna park' ***Magras & Zenos, 1997***;
- Significant degeneration of seminiferous epithelium in mice at 2.45 GHz, 30-40 min. **Saunder, 1981**;

Wi-FI level laptop exposure for 4-hr resulted in decrease in sperm viability, DNA fragmentation with sperm samples placed in petri dishes under a laptop connected via WI-FI to the internet. ***Avendano, 2012***;

- RFR exposure affected kidney development in rats (in-utero exposure) ***Pyrpasopoulou, 2004***;
- Pulsed RFR affected serum testosterone levels in mice ***Forgacs, 2006***;
- RFR caused structural changes in cells of mouse embryos ***Somozy, 1991***;
- A 24.3% drop in testosterone after 6 hours of CW RFR exposure ***Navakatikian, 1994***
- A 24.6% drop in testosterone and 23.2% drop in insulin after 12 hrs of pulsed RFR exposure. ***Navakatikian, 1994***

Oxidative damage/ROS/DNA damage/DNA repair failure

- Super-low intensity RFR effects at MW reasonant frequencies resulted in changes in genes; problems with chromatin conformation (DNA) ***Belyaev, 1997***;
- Super-low intensity RFR effects at MW reasonant frequencies resulted in changes in genes; problems with chromatin condensation (DNA) intensities comparable to base stations ***Belyaev, 1997***;
- RFR induced double-strand DNA damage in rat brain cells ***Kesari, 2008***;
- RFR induced DNA damage in cells ***Phillips, 1998***;
- RFR at 900 MHz for 2-12 hours caused DNA breaks in leukemia cells ***Marinelli, 2004***;
- RFR increased free radical production in rat cells ***Yurekli, 2006***;
- Digital cell phone RFR at very low intensities causes DNA damage in human cells; both DNA damage and impairment of DNA is reported ***Phillips, 1998***;
- 900 MHz cell phone signal induces DNA breaks and early activation of p53 gene; short exposure of - - 2-12 hours leads cells to acquire greater survival chance - linked to tumor agressiveness. ***Marinelli, 2004***;

- Activity of c-jun (oncogene or cancer gene) was altered in cells after 20 minutes exposure to cell phone digital TDMA signal ***Ivaschuk, 1997***;
- A 1-hr cell phone exposure causes chromatin condensation; impaired DNA repair mechanisms; last 3 days (longer than stress response) the effect reaches saturation in only one hour of exposure; electro- sensitive (ES) people have different response in formation of DNA repair foci, compared to healthy individuals; effects depend on carrier frequency (915 MHz = 0.037 W/Kg but 1947 MHz = 0.040 W/Kg) ***Belyaev, 2008***;
- 900 MHz study of mice for 7 days, 12-hr per day (whole-body) resulted in significant effect on mitochondria and genome stability ***Aitken, 2005***;
- Increased cell death (apoptosis) and DNA fragmentation at 2.45 GHz for 35 days exposure (chronic exposure study) ***Kesari, 2010***;
- Increase in DNA single and double-strand DNA breaks in rat brain cells with exposure to 2450 MHz RFR ***Lai & Singh, 1996***;
- Significant elevation in micronuclei in peripheral blood cells at 2450 MHz (8 treatments of 2-hr each) ***Trosic, 2002***

Cancer (other than brain), cell proliferation

- Changed growth rates in yeast cells ***Grundler, 1992;***
- RFR decreased cell proliferation at 960 MHz GSM 217 Hz for 30-min exposure ***Velizarov, 1999;***
- RFR caused a two-fold increase in leukemia in children ***Hocking, 1996;***
- RFR decreased survival in children with leukemia ***Hocking, 2000;***
- RFR associated with a doubling of leukemia in adults ***Dolk, 1997;***
- Increased risk in radar operators of cancer; very short latency period; dose response to exposure level of RFR reported. ***Richter, 2000;***
- Changes in cell cycle; cell proliferation (960 MHz GSM mobile phone) ***Kwee, 1997;***
- Lymphoma cancer rate doubled with two 1/2-hr exposures per day of cell phone radiation for 18 months (pulsed 900 MHz cell signal) ***Repacholi, 1997;***
- Statistically significant increase in malignant tumors in rats chronically exposed to RFR ***Chou, 1992;***
- Four-fold increase in eye cancer (uveal melanoma) in cell phone users ***Stang, 2001;***
- RFR accelerated development of both skin and breast tumors ***Szmigielski, 1982***

Disrupted calcium metabolism

- RFR affected calcium metabolism in heart cells ***Schwartz, 1990;***
- RFR affected calcium concentrations in heart muscle cells ***Wolke, 1996;***
- RFR caused calcium efflux in cells - can affect many critical cell functions ***Dutta, 1989;***
- Intestinal epithelial cells exposed to 2.45 GHz pulsed at 16 Hz showed changes in intercellular calcium. ***Somozy, 1993;***
- Statistically significant change in intracellular calcium concentration in heart muscle cells exposed to RFR (900 MHz/50 Hz modulation) ***Wolke, 1996***

Cardiac, heart muscle, blood-pressure, vascular effects

-RFR linked to adverse neurological, cardio symptoms and cancer risk ***Khurana, 2010;***

- Calcium ion movement in isolated frog heart tissue is increased 18% (P<.01) and by 21% (P<.05) by weak RF field modulated at 16 Hz ***Schwartz, 1990;***

- Significant increase in firing rate of neurons (350%) with pulsed 900 MHz cell phone radiation exposure (but not with CW) in avian brain cells ***Beason, 2002;***

- Cardiovascular system shows significant decrease in arterial blood pressure (hypotension) after exposure to ultra-wide band pulses ***Lu, 1999***

ADHS' report failed in measurements

When we met with ADHS, we specifically asked them to measure RF radiation and study its effects from all infrastructures of the smart grid. Since collector meters or as APS referred to them as Gateway smart meters and different levels of node smart meters being installed in our neighborhood, these meters all have very different emission. The Gateway smart meters have 3 internal antennas and some may even have an additional external antenna mounted on the electrical box. APS confirmed that there are 29 of these installed just in Sedona alone. Some node smart meters can act as repeaters with more frequent transmission and longer and higher reading. ADHS told us that its "experts" would know what to do when taking measurement and would take our concerns into considerations. Sometimes routers may also be used in the smart grid and all these wireless devices all emit RF radiation.

Without a thorough measurement of all parts of the mesh grid infrastructure, ADHS' report will not be able to provide a complete picture of the radiation impact. How do we know how much radiation we will be getting if there is a gateway smart meter installed close-by or just on the outside wall of our office where we can be less than a foot from it during work hours?

RF Exposure is like small doses of Arsenic over time....

Let use the example of arsenic poisoning. An ACUTE FATAL DOSE of Arsenic is in the range of 2-20mg/kg body weight/day. Thus, a relatively healthy person who weighs 160lbs, about 72.6kg, may die if he ingests between 0.145gm and 1.45gm of Arsenic in the form of Arsenic Trioxide, As2O3. i.e. 0.192gm to 1.92gm of Arsenic Trioxide. (Arsenic Trioxide is probably the most commonly available Arsenic compound). Considering the high density of the oxide, less than 1/8 of a teaspoon can be fatal. Smaller amounts may be fatal if unhealthy people, elderly or children are exposed. The symptoms of poisoning by SMALL amounts of Arsenic are not always distinguishable from symptoms of other afflictions. Thus, although one may think that he is being poisoned by Arsenic, only exact analysis can reveal if the symptoms are due to Arsenic poisoning or due to other maladies.

If a relatively healthy male is given 1/10 of the 1/8 tsp of Arsenic Trioxide, he may not die. So being exposed to the RF radiation of just a single smart meter, a healthy male may not have symptoms. Now what happens when he is given 1/5 of 1/8 tsp from a dozen different sources all at once? The same question we ask is what happens if an unhealthy person, the elderly or children are exposed to the many sources of RF radiation all at once, from WiFi, cell phone, cell tower, wireless router, wireless laptops, wireless printers, cordless phone and base stations, a bank of smart meters, gateway meters, baby monitors, etc. all in their own doses which are

below lethal limits? What happens if the exposure is not a one time exposure but hour after hour, day after day and year after year? The symptoms of RF radiation are also not always distinguishable from symptoms of other afflictions including flu, dizziness, insomnia, etc. Only exact analysis can reveal if the symptoms are due to RF radiation and if there are biological effects that do not have obvious symptoms or thermal effects.

If we don't have a definitive answer that Smart Meters are safe, we cannot assume that they are safe. "Unlikely to harm" is not the same as safe. The only responsible option will be to apply the precautionary principle to minimize the potential for damage.

Why is ADHS not definitively able to say Smart meters and RF are safe?
ADHS claimed that some of the studies they examined "cannot conclude that the cellular changes necessarily lead to disease." But do such cellular changes have an impact on our health? Smoking may not necessarily lead to disease but it surely impacts our health. ADHS also mentioned that, "sometimes a study that suggests an exposure is associated with an adverse health outcome is countered by another similar study that suggests there is no adverse health outcome at that exposure level." If one study suggests that arsenic can be fatal and another one suggests that there is no adverse health outcome, which one should an agency such as ADHS take into consideration when public health is at stake, when there is risk of irreversible DNA damage?

The Oregon Physicians did its homework finding evidence of potential harm from RF. In fact, ADHS does not need to look hard when there are more than 6,000 studies pointing to harmful health effects from RF exposure. If there is really no harmful health effect, there would not be so many people having symptoms. Shouldn't that be the first clue for ADHS to look into what is causing such symptoms? Shouldn't that be the first thing ADHS would do because they are a public health agency whose duty it is to protect public health?

Does this report fulfill the ADHS mission for Arizona citizens?
The mission of ADHS says clearly, "The Arizona Department of Health Services promotes and protects the health of Arizona's children and adults. Its mission is to set the standard for personal and community health through direct care, science, public policy, and leadership." Determining that Smart Meters are "not likely to harm" is not fulfilling its mission.

Why was the Precautionary Principle omitted in the report?
As far as Public Health policy is concerned, one should apply the Precautionary Principle when the health of humans and the environment is at stake. It is not be necessary to wait for scientific certainty to take protective action. First do no harm. If we wait for certainty, it can be too late. Smoking was strongly suspected of causing lung cancer long before the link was demonstrated conclusively. By then many smokers and people suffering from second-hand smoke had died of lung cancer. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446778/

In terms of protecting public health, it is wise to exercise precaution despite scientific uncertainty. When evidence gives us good reason to believe that a technology or substance may be harmful, we should act to prevent harm. If we always wait for scientific certainty, people may suffer and die and many may suffer irreversible damage.

Why is ADHS ignoring this principle?
Why do we need to apply the precautionary principle with Smart Meters? People are suffering.

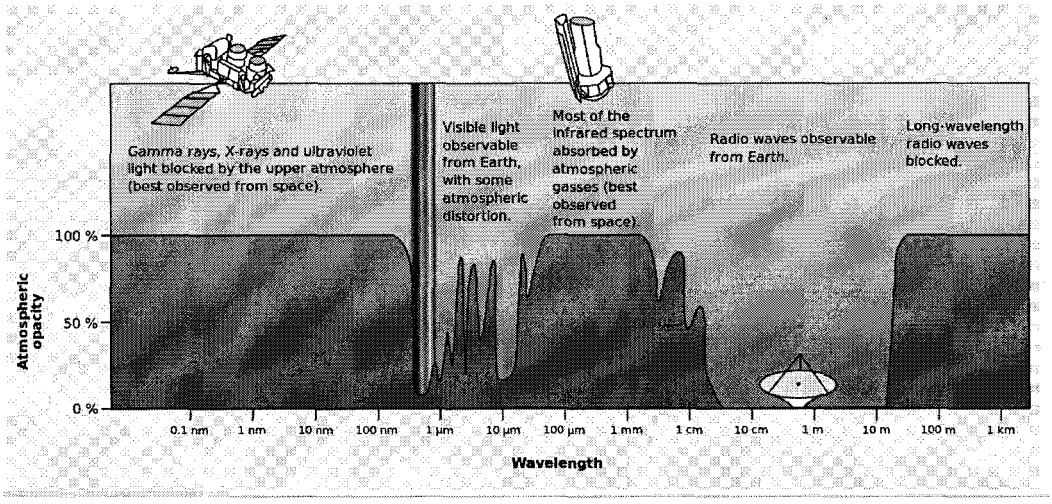
Symptoms reported from Smart Meters:

- Sleep problems (insomnia, difficulty falling asleep, night waking, nightmares)
- Stress, agitation, anxiety, irritability
- Headaches, sharp pain or pressure in the head
- Ringing in the ears, ear pain, high pitched ringing
- Concentration, memory or learning problems
- Fatigue, muscle or physical weakness
- Disorientation, dizziness, or balance problems
- Eye problems, including eye pain, pressure in the eyes,
- Cardiac symptoms, heart palpitations, heart arrhythmias, chest pain
- Leg cramps, or neuropathy
- Arthritis, body pain, sharp, stabbing pains
- Nausea, flu-like symptoms
- Sinus problems, nose bleeds
- Respiratory problems, cough, asthma
- Skin rashes, facial flushing
- Urinary problems
- Endocrine disorders, thyroid problems, diabetes
- High blood pressure
- Changes in menstrual cycle
- Hyperactivity or changes in children's behavior
- Seizures
- Recurrence of cancer

Wireless and Smart Meters are the New Tobacco
For years the tobacco industry covered up its knowledge that smoking was harmful to health. It was not until 1964, when he Surgeon General of the US, based on epidemiological evidence – not extensive laboratory scientific testing – made the statement that smoking can cause cancer and required labeling and regulated advertising. Following that, there were whistle blowers within the tobacco industry that shared documents revealing that the tobacco companies knew that its products caused harm. The studies that showed smoking is "not likely to harm" the health of the public sends a red flag when we see the ADHS report that "Smart Meters are not likely to cause harm."

ADHS' lack of expertise

The lack of scientific background on radiowave radiation is very obvious when ADHS implied that RF from Smart Meters is as safe as the RF from the sun. What is the major difference between the two? Radiowaves emitted by the sun are mostly blocked by the Earth's atmosphere and only the visible light spectrum can reach the earth. Radio waves on the other hand can penetrate the Earth's atmosphere better than any other form of wavelength as illustrated below by the courtesy of NASA.



Sunlight being the natural source of radiowaves has been in existence since the beginning of life as we have known it. Our body is used to its presence. In fact, sunlight is the vital source of energy for all life on this planet. Nothing will thrive without our sun. The first man-made radio waves were created in 1888 by Heinrich Hertz. Before that, apart from light waves and the odd lightning discharge, there were almost no radio waves in the atmosphere. The growth of radio waves in the atmosphere in the last one and a half centuries has followed the growth of industrial development, just like the concentration of carbon dioxide in the atmosphere.

Sunlight illuminates and we can read under the sun but not radio waves. Sunlight is in the visible spectrum so we can see it and we can avoid it by going into the shade or wearing sun protection. Radio/microwave frequencies are not visible. We can't see or smell it and it is very difficult to shield. Sunlight cannot penetrate shade or building, man-made radio waves can penetrate clothing, can even penetrate concrete walls. We can tell if we are "radiated" by the sun, but we can't tell if we are radiated by radio wave frequency (RF). We all know that smoking is bad for our health but we can at least block out second hand smoke but you cannot effectively block out radio waves.

FCC Guidelines for Evaluating RF Radiation Exposure Limits
The FCC Guidelines are based on setting limits for human exposure. There are two sets of exposure limits.

- **Occupational/Controlled**
- **General Population/Uncontrolled**

These are Maximum Permissible Exposure (MPE) limits averaged over the body and averaged over time. The Occupational/Controlled limits are five times higher than the General Population/Uncontrolled limits at all frequencies above 3 MHz. The averaging period for

Occupational/Controlled exposure is six minutes for exposure to frequencies below 15 GHz. The averaging time decreases as the frequency increases from 15 GHz to 300 GHz. **It is important to note that the FCC does not allow time averaging for General Population/Uncontrolled exposure.** The MPE limits are the same for both the electric field and the magnetic field.

Time averaging is not appropriate for General Population/Uncontrolled exposure

In the FCC OET BULLETIN 56 Fourth Edition August 1999, it states:

These situations usually only occur in workplace environments where exposure can be monitored and controlled. ***For general population/uncontrolled exposures****, say in a residential neighborhood, it is seldom possible to have sufficient information or control regarding how long people are exposed, and* ***averaging of exposure over the designated time period (30 minutes) is normally not appropriate****. For such public exposure situations, the MPE limits normally apply for continuous exposure."*

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)"

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment provided they are fully aware of the potential for exposure, and are able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels considered acceptable for occupational, or radio frequency trained individuals.

So according to the FCC Bulletin, time averaging is only allowed in workplace environments and not in residential neighborhood for General Population/Uncontrolled exposure. Therefore, Smart Meters being installed in residential neighborhoods exposing the general population in uncontrolled exposures is not appropriate and time averaging is not permitted.

Time averaging is only appropriate when exposure is short term to ensure no one will be accidentally cooked. Because of the cumulative effects to long-term exposure, lower dosages still results in some biological disruption, although it may take longer to become apparent. Henry Lai notes that rats had behavioral disruption after less than an hour of high radiation (3.75W/kg @ 1.28 GHz). At lower power densities, it could take 7 hours a day for 14 weeks (0.7 W/kg @2.45 GHz) to see a behavioral disruption. Still smaller disruptions could be found with 7 hours a day of 0.14 W/kg@2.45 GHz after 90 days.

What and how to measure Smart Meters?

The data from the wireless Smart Meter is sent out in short transmission bursts, which usually last only from 12 to 120 milliseconds (ms) at a time. These transmission times are referred to as "duty cycles." A 100% duty cycle corresponds to continuous operation, e.g., 24 hours/day. A 1% duty cycle corresponds to a transmitter operation of 1% per 24 hours, which means 14.4 minutes/day.

The most controversial question in the assessment of wireless Smart Meters is how often this intermittent burst occurs per day? This short time sequence makes it difficult to detect and measure the signal properly with RF instrumentation.

The difficulty most professional instruments have is that they collect the data twice per minute. However, when the short (50-millisecond) burst occurs during the time when the instrument is not recording, it will not be visible. Only if the measurement period and transmission burst coincide in time will the signal be recorded. This is likely to account for the different amplitudes detected. The instrument may measure when the signal is building up or phasing out. This appears to be the reason for the significantly varying amplitude.

Accurate and precise measurements for the power density and duty cycles are not easily performed even with costly professional equipment. Few instruments are able to detect the short transmission bursts properly.

Average power density readings are misleading because they severely underrate the peak power levels.

When conducting measurement for wireless Smart Meter, peak amplitude levels and the burst cycle (duty cycle) should be recorded and extrapolated.

In order to obtain accurate measurement, the instrument should have a probe and a data logger. The instrument also needs to have a high capture range of the transmission pulses. Some instruments may clip the amplitude levels at a certain high level resulting in not being able to measure the strength of the signal. It is crucial to use the data logging technique because data logging is commonly used in scientific experiments and in monitoring systems where there is the need to collect information faster than a human can possibly collect the information, and in cases where accuracy is essential.

ARRA used the wrong tool for the job

As for the meter being used to measure RF of Smart Meter, it has to be one that was used by the FCC or at the very least certified by the FCC for us to compare the reading. The Tenmars meter is made in Taiwan and costs around $140 online.

The Tenmar TM-195 meter does not have any data logging capability and is also not capable of capturing the nano-second short burst from smart meters. Its measurements will not be deemed accurate or reliable. Here's the example:

According to the FCC MPE report for the Elster smart meter installed by APS with the FCC ID: QZC-RX2EA4, the test result at 20cm for highest reading is 0.182 mW/cm2 or 1.82 W/m2. Since the measurement taken by FCC is inside a chamber with a single meter, we will use the single meter rural setting for comparison.

According to the ADHS report, the highest reading for rural single meter at one foot is 0.000163 W/m2. Compare to the Oregon Physicians' report the Elster meter at 5 feet, the measurement is 0.0038 to 0.011 W/m2, and at 20 feet between 0.000362 to 0.000493 W/m2.

The Tenmars TM-195 managed to pick up RF radiation of 0.000129 W/m2 from an analog meter which does not have any RF emitting capability as illustrated by the response to Question 11 in "PG&E's response to Administrative Law Judge's October 18, 2011 ruling directing it to file clarifying Radio Frequency Information." (http://takebackyourpower.net/wp-content/uploads/2012/04/Smart-Meter-Health-14000-to-190000.pdf) According to ADHS, this measurement of the analog meter (0.000129 W/m2) is almost as high as the reading of the rural smart meter (0.000163 W/m2) which again raises further questions of its accuracy.

It doesn't seem to make any sense with those measurements in the ADHS report at all, whether it is measuring the nano second short burst of smart meters or the non-transmitting analog meter. And it somehow makes you really wonder about the accuracy of the measurement ADHS is basing upon when it was so far off from what was in the FCC's report.

Measurements

SMART METER Measurement

	Distance from Smart Meter	Power Density
FCC test report	20 cm	1.82W/m2
ADHS report	1 foot	0.0000043 to 0.000163 W/m2
Oregon Physicians' report	5 feet	0.0038 to 0.011 W/m2
Oregon Physicians' report	20 feet	0.000362 to 0.000493 W/m2

ANALOG METER Measurement

		Power Density
ADHS report	Analog meter	0.000129 W/m2
PG&E's response to judge	Analog meter	0 W/m2

Now let's look at the specifications of this Tenmar TM-195 meter. It is supposed to function under the conditions with ambient temperature of +23□C ± 3□C or from 68□F to 79□F. From July to September, the average temperature in Phoenix is around 88□F (31□C) in the middle of the night to 95□F (35□C) and it is not uncommon for the daytime temperature to reach over 104□F (40□C). In fact, it's not uncommon to see over 100□F at 9 pm. Those measurements taken during the day will not be within the tolerance specification of the TM-195 meter to be accurate.

We would expect any "official" test done to measure smart meters by using instruments that carry Certification of Calibration traceable to the National Institute of Standards and Technology or other international equivalent standard. If any one wants to file a complaint with the FCC regarding any radiation emitting device being out of compliance, the FCC would not even accept evidence of readings taken by any instruments other than the same probe it used which is a professional grade used by the industry for radiation compliance.

Arizona Radiation Regulatory Agency

As stated in the ADHS report, the Arizona Radiation Regulatory Agency uses the Tenmars TM-195 during routine use to ensure that industrial registrants registered to operate radio frequency devices do not exceed the maximum permissible exposure (MPE) limits as defined in the Arizona Administrative Code Title 12, Chapter 1, Article 14.

Arizona Cell phone towers violate safety rules in the News

CBS5 Arizona KPHO newscast aired November 10, 2014. CBS has found that many of those cell phone towers in the Valley violate federal safety rules intended to keep people safe. Engineer Marv Wessel, with RF Solutions, has inspected thousands of cell phone antenna sites across the country. He said that many of the antenna sites he's seen, have emissions well over the federal safety limits. Wessel showed CBS 5 another site, in a community near Camelback Mountain in Phoenix, where residents and maintenance crews can walk right by the antennas and the reading was so high that it interfered with the camera. The only thing keeping people away from the antennas was a plastic chain and some PVC pipe.

According to Wessel, the FCC doesn't have the time or manpower to inspect these sites, or respond to complaints. Wessel even called a phone number listed on one of the cell towers, to say he'd be working close by and ask about any safety concerns. "As long as I wasn't working on their equipment they didn't seem too concerned," said Wessel. "I was fine to go anywhere I wanted on the rooftop." Read more: http://www.kpho.com/story/27348721/cell-towers-raise-concerns-about-safety#ixzz3L98NT5ws

We need to have the readings of Smart Meters done again using the right instruments with data logging capabilities, and by the well-trained personnel.

None of these numbers provided in the ADHS report can be considered meaningful.

Conclusions and recommendations:

As noted in the beginning of this evaluation, he ADHS report is a stunning example of interdisciplinary research gone wrong. As is often the case with interdisciplinary research, experts in their own field badly misinterpret and make erroneous assumptions about information and principles in a field foreign to them. Medical and health researchers unfamiliar with engineering principles, measurement protocols and metrics, make invalid measurements and draw invalid conclusions from them. On the other hand, engineers make invalid assumptions about biological processes and their medical outcomes, such as tissue heating.

Thousands of peer-reviewed publications leave no doubt as to the biological activity of extremely small doses of electromagnetic radiation. Yet, engineers who set safety standards long ago supposedly to protect us did so without medical considerations and insist the only biological effect of concern is tissue heating.

ADHS did not do a study as requested by the ACC. By coming to conclusions by reviewing existing literature and cherry picking only those studies that claimed no association of a particular health effect with RF, ADHS is putting all Arizonans at risk.

Sedona Smart Meter Awareness recommends the following actions:

1. Remove wireless Smart Meters or wire them. There are enough studies and evidence showing the harmful health effects of RF radiation to warrant the immediate halt of wireless Smart Meters in Arizona. Rate payers should have analog meters as the default option. For those rate payers who opt in for a smart meter, they can have one as long as it is hard-wired and will not transmit any RF radiation or dirty electricity that will affect any of his neighbors. Such rate payers can pay for all additional expense for hard-wiring, shielding and filtering and conversion of wireless Smart Meters to wired options. All infrastructures including but not limited to routers, Gate Keepers, repeaters, should also be hard wired.

2. There should not be any additional fees for those who choose the time-proven safe and reliable option of analog meters. The only fees allowed should just be the actual cost of reading the meters which is 90 cents as stated in our electric bills.

3. The Commission should also ensure that all of the utilities to stock up on analog meters for future use. All those analog meters replaced by the utilities should be kept in storage for future placement after they have been serviced and certified.

4. If the Arizona Corporation Commission allows smart meters to be installed, it then should buy its own Probe and do its own real independent study to find out the long-term (not 12 months but 20 years) health effects. One highly recommended model is the Gigahertz Solutions Model HFE-59B with data logging capability.

5. ACC should also pay for the translation of the Russian study that ADHS does not have the money to pay and therefore chosen to ignore.

6. All future studies the Commission requests should only be done by those who have the right expertise, experience and ability. The ADHS has demonstrated its lack of all of the above.

7. ACC needs to require that all of the utilities who installed smart meters must put aside monies in a secure fund for those whose health has been damaged by these wirelessly transmitting meters.

8. The ADHS study should be discarded.